



University of Otago, Christchurch
Te Whāre Wananga o Ōtāgo ki Ōtautahi

PhD Opportunities on Christchurch Campus

Research interests
Potential topic areas
Supervisors

[last updated August 2020]

For information on regulations and requirements for PhD study
through the University of Otago, see
www.otago.ac.nz/study/phd

For scholarships information, see
www.otago.ac.nz/study/scholarships

If you wish to apply for admission to PhD via Christchurch campus, contact
Ruth Helms, Manager Research Degrees, Christchurch Campus
ruth.helms@otago.ac.nz

DEPARTMENT OF ANAESTHESIA

Anaesthesia and Pain Medicine

Potential topics

- Enhanced perioperative recovery
- Drug delivery in anaesthesia and pain medicine
- Predictors of persistent pain
- Psychosocial variables and characteristics of patients with persistent pain
- Mechanisms of complex regional pain syndrome (CRPS)
- Digital self-management intervention (iSelf-help) for people with persistent pain
- Opioid related deaths
- Pain content in the undergraduate medical curriculum
- Neuropathic pain and central sensitisation
- Cannabinoids and persistent pain

CONTACTS

Prof Edward (Ted) Shipton

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Claire Willis

Administrator

Department of Anaesthesia

University of Otago, Christchurch

03 364 1642

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Models of anaesthetic agent uptake to develop tools to predict the rate of delivery to patients

Potential topics

- Processed electroencephalogram in anaesthesia and post-operative delirium and cognitive dysfunction
- Use of effect site concentrations in anaesthesia

CONTACTS

A/Prof Ross Kennedy

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Claire Willis

Administrator

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Intensive Care

Potential topics

- Model-based therapeutics
- Core therapies (pulmonary, cardiovascular and metabolic) in intensive care
- Glycaemic control

CONTACTS

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DEPARTMENT OF GENERAL PRACTICE

General Practice

Potential topics

- Evolving models of care
- Teamwork
- Interprofessional continuing education
- System integration
- Alliancing
- Quality improvement – system level measures
- Independent consumer health information
- Prescribing education

CONTACT

Prof Les Toop

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DEPARTMENT OF MEDICINE

Age and Ageing

1. Support of older people

Potential topics

- Big data – developing models to predict ageing
- Models of care in the community
- Health needs and health issues commonly experienced in older people
- Model of service delivery

2. Interprofessional development

Potential topics

- Health professional education
- Interdisciplinary approaches to research questions
- Application of mixed methods of research (qualitative and quantitative)

CONTACT

Dr Hamish Jamieson
Health Care of the Elderly
Burwood Hospital, Christchurch
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Canterbury Rheumatology and Immunology Research Group

Potential topics

- Management of gout and rheumatoid arthritis
- Pharmacology
- Granulomatous polyangiitis (GPA, previously Wegener's granulomatosis)
- Inflammatory mechanisms in rheumatoid arthritis

CONTACT

Prof Lisa Stamp
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Christchurch Clinical Pharmacology Research Group

Potential topics

- Pharmacogenetics: of adverse drug reactions; of drug exposure; of drug response
- Pharmacokinetics: physiological based modeling; in clinical studies
- Pharmacoepidemiology: clinical questions addressed using a large regional data set, e.g., adverse drug reactions

CONTACT

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DEPARTMENT OF MEDICINE continued

Education Research

Potential topic

- Health professional education

CONTACT

Prof Tim Wilkinson
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Gastroenterology Research

Potential topics

- Inflammatory Bowel Disease
- Pharmacogenetics in inflammatory bowel disease
- Autoimmune liver disease
- Coeliac disease
- Colorectal cancer
- Irritable Bowel Syndrome
- Nutrition and gut health
- Nutrition

CONTACTS

Prof Richard Geary
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Dr Catherine Stedman
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Prof Andrew Day
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New Zealand Brain Research Institute

www.nzbri.org

1. Parkinson's and Related Disorders

We have some substantial projects underway in Parkinson's disease and other neurological disorders such as multiple sclerosis and Huntington's. Our research is conducted at a human behavioural and clinical level. Our methods include *brain imaging* (functional, structural, diffusion and perfusion MRI; metabolic and protein deposition PET), *movement measurement* (eye and hand tracking), and *neuropsychological assessment*. These projects have roles for students from diverse backgrounds, including psychology, neuroscience, physics, mathematics, statistics, and medicine.

Potential topics

- Progression in Parkinson's disease: evidence from serial eye movement, MRI, and cognitive assessment
- Freezing and falling in Parkinson's disease – who, why and what to do
- Multiple sclerosis – epidemiology and mechanisms
- Cerebral haemodynamic function in ageing and dementia
- Saccadic eye movements in health and in neurological disorders
- Adaptation of human saccadic eye movements
- Hand-eye coordination in real-world tasks.
- Mathematical modeling of neurological disease onset, incidence, and progression
- Brain imaging in other populations including very preterm birth, mild traumatic brain injury, etc.

2. Neurotechnology Group

www.neurotech.org.nz

Potential topics

- The phenomena of microsleeps and lapses in sustained attention
- Detection and prediction of microsleeps and attention lapses from electrophysiological signals
- Obstructive sleep apnea - treatment efficacy and adverse effects in the brain

CONTACTS

Prof Tim Anderson
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Dr Michael MacAskill
(movement)
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Dr Tracy Melzer
(brain imaging)
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Dr Toni Pitcher
(PD imaging and epidemiology)
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CONTACT

Prof Richard Jones
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DEPARTMENT OF MEDICINE continued

Respiratory Physiology Research Group

Potential topics

- Biomarkers in Pulmonary Artery Hypertension
- Energy consumption in COPD
- Management of pneumothorax
- Beta-blocker in COPD

CONTACT

Prof Lutz Beckert
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Christchurch Heart Institute

www.otago.ac.nz/chchheart

1. Physiology

Potential topics

- Novel therapeutic agents for heart failure
- Novel therapeutic agents for myocardial infarction
- Physiology of novel vasoactive peptides
- Models of cardiac disease

CONTACT

Prof Chris Charles
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2. Clinical Research

Potential topics

- Ventricular remodelling after myocardial infarction
- Hormone-guided treatment of heart failure
- Bioactivity of "new" vasoactive hormones

CONTACTS

Prof Mark Richards
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Prof Richard Troughton
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Dr John Lainchbury
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DEPARTMENT OF MEDICINE continued

Christchurch Heart Institute (cont)

3. Translational Biodiscovery Lab

Potential topics

- Identification of new circulating peptides: their biological activity and diagnostic applications
- Effect of hormones on, and their responses to, bone growth
- Biochemical and metabolic studies of BNP related peptides and their measurement in cardiovascular disorders
- Studies of vasoactive hormones in isolated perfused hearts
- Cytokine signalling, neurohormones and intracellular signalling pathways in experimental myocardial infarction
- The role of hormones regulating metabolism in cardiovascular disease
- Neurohormonal aspects of cardiovascular disease - clinical studies
- Neurohormonal aspects of cardiovascular disease - laboratory studies
- Clinical and Novel Biomarkers in Cardiovascular Disease
- Iron regulation in Heart Disease
- Inflammation in Cardiovascular Disease

CONTACTS

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Dr Sarah Appleby
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Dr Janice Chew-Harris
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Prof Mark Richards
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4. The Omics Lab

Potential topics

- Genetics/Genomics, Epigenetics and heart disease in the New Zealand population
- Circulating Noncoding RNAs in heart disease
- Proteomics and protein biomarkers in cardiovascular disease

Investigating inequities in Cardiovascular Health outcomes for Māori

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CONTACTS

Prof Vicky Cameron
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Dr Allamanda Faatoese
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Dr Moritz Lassé
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5. Heart Disease

Potential topics

- Trends in management and outcomes of unstable angina and myocardial infarction
 - development of prospective audit/database
 - comparison with other New Zealand and Australian centres
- Have priority scores improved elective treatment of heart disease?
- Effects of chronic heart disease on quality of life

CONTACT

Dr John Elliott
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CENTRE FOR POSTGRADUATE NURSING STUDIES

www.otago.ac.nz/christchurch/departments/nursing

Management of Long-Term Conditions

Potential Topics

- Quality of life for people with chronic health needs
- Development of nursing roles in chronic disease management
- Research with older people
- Mental health/Psychological therapies
- Family centred care
- Healthcare and ageing population
- Advanced aged assisted living and rest home care
- Self-management for long-term conditions with older adults
- Pain management
- Parents of children with long term respiratory conditions
- Pacific island populations

CONTACTS

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A/Prof Philippa Seaton

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Prof Marie Crowe

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Dr Henrietta Trip

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Intellectual or Learning Disability

Potential Topics

- Body image of women with intellectual disability
- Sexuality and sexual health of people with Intellectual disability
- People with intellectual disability negotiating the legal system
- Advanced care planning for people with life limiting conditions
- Parents with intellectual disability
- Primary health care for people with intellectual disability
- Mental health of people with intellectual disability
- Intellectual disability nursing
- Health and ageing across the lifespan

CONTACTS

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Dr Henrietta Trip

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Women's Health

Potential Topics

- Cultural norms and wellbeing
- Hormone replacement therapy and ageing
- Self-management for long-term conditions with older adults
- Gender health impacts

CONTACT

Dr Beverley Burrell

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Family Centred Care

Potential Topics

- Family centred care within paediatrics
- Implementation of family centred care within health care settings
- Chronic respiratory disease
- Supportive care
- Families with children with intellectual or physical disability
- Child health

CONTACTS

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Dr Henrietta Trip
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Dr Chris Moir
chris.moir@otago.ac.nz

Mental Health

Potential Topics

- Improving clinical outcomes
- Psychosocial interventions for bipolar disorder
- Interventions for mood disorders
- Translating research into practice
- Psychosocial interventions in an inpatient setting

CONTACT

Prof Marie Crowe
marie.crowe@otago.ac.nz

Health Leadership

Potential Topics

- Quality systems and management
- Risk management
- Health service leadership and management
- Socio political aspects of nursing

CONTACTS

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Dr Virginia Jones
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Health Services Delivery

Potential Topics

- Nursing workforce
- Care delivery modes
- Innovation in health care
- Improving clinical outcomes
- Health technology
- Clinical judgment/reasoning development

CONTACTS

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Dr Raewyn Lesa

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Dr Chris Moir

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Health Professional Education

Potential Topics

- Technology enhanced learning and teaching (TELT)
- Inter-professional education
- Simulation
- Teaching and learning practice
- Clinical learning in higher education

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Dr Raewyn Lesa

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CENTRE FOR POSTGRADUATE NURSING STUDIES continued

Nursing Practice

Potential Topics

- Advanced nursing practice
- Ethics
- Cultural safety and diversity
- Socio-political issues and nursing
- Preceptorship/mentorship
- The patient experience
- Change management

CONTACTS

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Dr Raewyn Lesa

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Dr Chris Moir

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The Centre for Postgraduate Nursing Studies (CPNS) has a wide range of expertise.
We invite health professionals to contact us to discuss your areas of interest and study requirements.

Gynaecological Cancer Research Group

Potential topics

- The Detections and / or Management of cervical precancerous lesions
- Dietary compounds and ovarian cancer
- Targeted drugs in advanced ovarian cancer
- Ovarian cancer cell models in vivo and possible drug targets

CONTACTS

A/Prof Peter Sykes

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Dr Kenny Chitcholtan

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DEPARTMENT OF ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL MEDICINE

Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) Group

Candidates hoping to conduct doctoral research in the suggested areas who require financial support will need A grades in order to be successful in an application for a University of Otago Doctoral Scholarship. For information about scholarships see www.otago.ac.nz/graduate-research/scholarships/phd/index.html

Other research projects that have funding associated with them are advertised on the CReaTE website. See the 'Study and work with us' area on www.otago.ac.nz/regenerative-medicine.

1. Translational Tissue Engineering and Regenerative Medicine Research

Potential topics

- Translational Regenerative Medicine strategies for cartilage and bone repair
- 3D Biofabrication of osteochondral tissue engineered constructs for joint resurfacing
- 3D Printing of nano-composite scaffolds for bone regeneration
- Bio-assembly of organotypic 3D tissue models
- In vivo evaluation of Additive Manufactured custom titanium orthopaedic implants
- Optimising mesenchymal stem cell niche for musculoskeletal regenerative medicine
- *In vitro* 3D culture models for mimicking native tissue organisation *in vivo*
- Spectral (MARS) micro-CT imaging of cartilage and bone health

CONTACTS

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Prof Gary Hooper

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Dr Khoon Lim

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CReaTE Group

create.research@otago.ac.nz

2. Orthopaedic medical devices

Potential topics

- Additive manufacturing of porous scaffolds for stimulating bone formation
- Optimisation of the implant-bone interface for stimulating bone formation
- *In vivo* models for optimised medical device design
- Total joint replacement and clinical outcomes

CONTACTS

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CReaTE Group

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DEPARTMENT OF ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL MEDICINE cont

Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) Group (cont)

3. Advanced 3D Printing and bio-fabrication

Potential topics

- Translational Regenerative Medicine strategies for cartilage and bone repair
- 3D Biofabrication of osteochondral tissue engineered constructs for joint resurfacing
- 3D Printing of nano-composite scaffolds for bone regeneration
- Bio-assembly of organotypic 3D tissue models
- In vivo evaluation of Additive Manufactured custom titanium orthopaedic implants
- Optimising mesenchymal stem cell niche for musculoskeletal regenerative medicine
- *In vitro* 3D culture models for mimicking native tissue organisation *in vivo*
- Spectral (MARS) micro-CT imaging of cartilage and bone health

CONTACTS

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Prof Gary Hooper

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Dr Khoon Lim

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CReaTE Group

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Clinical Orthopaedic Research

Potential topics

- Acoustic emission monitoring for detecting wear/failure in total joint replacement
- Joint proprioception following total joint replacement
- Measuring changes in bone mineral density in total hip and knee arthroplasty
- Random controlled trials evaluating total joint arthroplasty and survival
- Prospective studies evaluating total joint arthroplasty and survival from the New Zealand National Joint Registry
- Prediction of outcomes following hip and knee joint replacement

CONTACTS

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Dr Jennifer Dunn

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Mr David Kieser

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DEPARTMENT OF ORTHOPAEDIC SURGERY AND MUSCULOSKELETAL MEDICINE cont.

Pain Research

Potential topics

- Clinical outcomes following major joint surgery, particularly examining factors associated with poor functional outcomes and/or post-surgical chronic pain (prospective studies)
- Chronic pain coping strategies and decisions associated with using strategies in daily life
- Mindfulness and positive psychology approaches to living with chronic pain
- Factors associated with resilience and living with persistent pain
- Experience of living with chronic pain (for example osteoarthritis, fibromyalgia)
- Clinical practice change and knowledge translation from theory to clinical practice in pain and pain management
- Long-term use of analgesics in persistent pain

CONTACT

Dr Bronwyn Lennox Thompson
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Neurorehabilitation Research

Potential topics

- Recovery and outcomes after traumatic brain injury including concussion
- Clinical practice change and knowledge translation from evidence to practice in neuro rehabilitation
- Development of clinical practice guidelines for managing concussion in the New Zealand context
- The role of psychological factors in recovery following neurological injuries
- Spinal cord injury rehabilitation
- The New Zealand Spinal Cord Injury Registry and long-term outcomes of spinal cord impairment
- Measuring rehabilitation outcomes

CONTACT

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Dr Jo Nunnerley
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PATHOLOGY AND BIOMEDICAL SCIENCE

Centre for Free Radical Research

www.otago.ac.nz/free-radical

1. Potential topics

Projects available for cell biology, biochemistry or microbiology candidates:

- Regulation of cell death pathways in cancer and immune cells
- Sensitising pathogenic bacteria to killing by neutrophils
- Effect of oxidants on cell signalling and epigenetic processes
- Monitoring and promoting oxidative stress in tumours
- Oxidative stress in neurological disease

CONTACT

Prof Mark Hampton
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2. Potential topics

- Radical reactions with superoxide
- The role of free radicals and chlorine bleach in inflammatory diseases
- Bacterial killing by neutrophils
- The enzymology of peroxidases
- Identification of biomarkers of hypochlorous acid

CONTACT

Prof Tony Kettle
03 364 0577
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3. Potential topics

Projects for cell biology, biochemistry or genetics students, and for medical students, or nutrition students:

- Understanding the role of vitamin C in cancer biology, using cell culture models, animal models of breast cancer and glioma, and human clinical studies. We are investigating the mechanism of action and potential interactions with chemotherapy and radiation, using any and all of the above methods.
- The effects of optimal micronutrient intake on human health and immunity. Of particular interest is the capacity of vitamin C in preserving neutrophil immune cell function.
- Understanding the role of vitamin C in the regulation of the 2-oxoglutarate-dependent dioxygenases that control the hypoxic response and many epigenetic processes. These projects involve cell biology and genetics methodologies

CONTACT

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Gene Structure and Function Laboratory

www.otago.ac.nz/gene-structure

Potential topics

- Pharmacogenomics and genomics
- Genetics of complex disease and traits
- Applications of nanopore DNA sequencing

CONTACT

Prof Martin Kennedy
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Inflammation Research Group

www.otago.ac.nz/christchurch/research/inflammation

Potential topics

- Gas Mediators in Inflammation
- Neurogenic Inflammation in Acute Pancreatitis, Sepsis, and Burns
- Chemokines in Acute Pancreatitis, Sepsis, and Burns
- Apoptosis of Pancreatic Acinar Cells

CONTACT

Prof Madhav Bhatia
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Infectious Diseases and Microbiology

www/Otago.ac.nz/infection-group

Potential topics

- Pneumonia and other respiratory infection
- Legionnaires' disease
- Vitamin D and infection
- Staphylococcus aureus disease
- Leprosy in the Pacific

CONTACTS

Prof Steve Chambers
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Prof David Murdoch
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A new focus is on identifying micro-organisms in situ with antibody directed contrast targeting

CONTACTS

Prof Anthony Butler
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Prof Steve Chambers
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PATHOLOGY AND BIOMEDICAL SCIENCE continued

Mackenzie Cancer Research Group

www.otago.ac.nz/mackenzie-cancer

1. Potential topics

- Adiposity, chemotherapy and breast cancer
- Exercise and breast cancer (in vivo, observational studies and clinical trials)
- Inflammation and cancer
- Immune response in non-melanoma skin cancers
- Immunotherapy and immune related adverse events in melanoma (observational studies)

Background: cancer, cell biology, molecular biology, chemotherapy, genetics

CONTACTS

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A/Prof Gabi Dachs
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Prof Bridget Robinson
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2. Potential topics

- Genetic variation and cancer development
- Gene expression and tumour development

Background: cancer, molecular biology, genomics, genetics

CONTACTS

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Prof Bridget Robinson
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3. Potential topics

- Vitamin C in cancer (cell culture, in vivo, observational studies and clinical trials)
- Vitamin C and immune cells (cell culture, in vivo and observational studies)
- Hypoxia, HIF-1 and cancer therapy (cell culture, in vivo, observational studies and clinical trials)
- Tracking tumour response using MARS imaging (in vivo studies)

Background: cancer, cell biology, biochemistry, molecular biology

CONTACTS

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PATHOLOGY AND BIOMEDICAL SCIENCE continued

Nutrition in Medicine Research Group

www.otago.ac.nz/christchurch/research/nutrition-in-medicine/index.html

Potential topics

- Infection and immune function
- Critical illness and septic shock
- Mood and cognitive health
- Diabetes and metabolic health

CONTACTS

A/Prof Anitra Carr
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PAEDIATRICS AND PAEDIATRIC SURGERY

Paediatric Gastroenterology

Potential topics

- Inflammatory Bowel Disease
- Host:pathogen interactions in the gut
- Intestinal epithelial cell responses
- Coeliac disease
- Nutrition

CONTACT

Prof Andrew Day
Department of Paediatrics
03 372 6718
andrew.day@otago.ac.nz

Paediatric Infectious Diseases

Potential topics

- Infections in children
- Childhood vaccination

CONTACT

Dr Tony Walls
Department of Paediatrics
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Paediatric Diabetes and Endocrinology

Potential topics

- Epidemiology of diabetes
- Emerging technologies and translational research
- Automated insulin delivery
- Disordered glucose metabolism in other paediatric conditions

CONTACT

Dr Martin de Bock
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Neonatal Paediatrics

Potential topics

- Late effects of premature birth
- Life course approach to cardiovascular risk
- Screening for early life adversity
- Strategies to reduce hyperoxia in premature infants

CONTACT

Dr Sarah Harris
Department of Paediatrics
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Paediatric Respiratory Diseases

Potential topics

- Asthma epidemiology
- Cystic fibrosis diagnosis - diagnostic test performance and prediction

CONTACT

A/Prof Philip Pattermore
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PAEDIATRICS AND PAEDIATRIC SURGERY continued

Paediatric Surgery

Potential topics

- Validation of 3D printed thoroscopic model of surgical expertise in oesophageal atresia repair

CONTACT

Prof Spencer Beasley
Department of Paediatrics
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DEPARTMENT OF POPULATION HEALTH

Sex work
Social determinants of health
Social policy
Vulnerable Populations
Qualitative approaches

CONTACT

Prof Gillian Abel
03 364 3602
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Health professionals and interprofessional boundaries
Critical approaches to public health and health promotion
Qualitative methods

CONTACT

A/Professor Lee Thompson
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Communicable diseases epidemiology and policy
Environmental health policy

CONTACT

Dr Cheryl Brunton
03 364 3625
cheryl.brunton@cdhb.health.nz

Public health aspects of drug and alcohol misuse

Potential topics:

- Assessing drug and alcohol harms using administrative data sets
- Social and structural determinants of drug and alcohol-related harms
- Evaluating the impacts of drug policy
- Prevention of drug and alcohol-related

CONTACT

Dr Rose Crossin
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DEPARTMENT OF POPULATION HEALTH continued

Neighbourhoods and health

Urban health

Social and distributional impacts of transport policy

Transport and Ageing

Pedestrian falls

Accessibility to services and relation to health and social outcomes

CONTACT

Dr Angela Curl

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Evidence-based practice

Patient safety and quality improvement

Systematic reviews/meta-analysis

Health services and epidemiological research using administrative data

CONTACT

Dr Phil Hider

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Quantitative Analysis

I can provide co-supervision for candidates wishing to undertake quantitative research projects including clinical trials and epidemiological studies.

Epidemiological research using large administrative data sets

Potential areas include:

- Pharmacoepidemiology
- Research using the Statistics New Zealand Integrated Data Infrastructure

Quantitative methods research via simulation

I am interested to receive proposals from candidates wishing to undertake research into epidemiological or other quantitative methods via computer simulation

CONTACT

Dr Jonathan Williman

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DEPARTMENT OF PSYCHOLOGICAL MEDICINE

Addiction and co-existing disorders

Potential topics

- Prevention and treatment of alcohol and other substance use disorder
- Addictive overeating
- Behavioural addictions including gambling, sex and electronic media addictions
- Politics of alcohol and other drugs
- Medicinal cannabis
- Personality and addiction
- Mental health outcomes associated with methamphetamine

CONTACTS

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Anxiety disorders and treatment

CONTACTS

A/Prof Caroline Bell

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Dr Jenny Jordan

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Cognitive impairment and mood disorders

Neurocognitive interventions

CONTACTS

Prof Richard Porter

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Dr Katie Douglas

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Eating disorders

Obesity

CONTACTS

Prof Lois Surgenor

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Dr Jenny Jordan

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Longitudinal health and social outcomes

Potential topics

- Developmental antecedents of mental health and addiction problems in adulthood
- Adult sequelae of childhood illness and adversity
- Interactions between social factors, life events and mental health outcomes

CONTACT

A/Prof Joe Boden

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DEPARTMENT OF PSYCHOLOGICAL MEDICINE continued

Maori Mental Health

CONTACT

Dr Cameron Lacey
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Personality disorders and treatment

CONTACTS

Prof Roger Mulder
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Dr Dave Carlyle
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Physical - Mental health interface

CONTACTS

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Psychiatric pharmacogenetics

Potential topics

- Genetic predictors of psychiatric medication side effects
- Personalised prescribing for psychiatric disorders
- Methamphetamine-related health problems

CONTACT

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Forensic Psychiatry

Potential topics

- Mental health of prisoners
- Forensic aspects of substance use disorders
- Special patients
- COVID-19 prison response

CONTACT

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Psychological adaptation to medical illness

Psychological aspects of cancer

CONTACT

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DEPARTMENT OF PSYCHOLOGICAL MEDICINE continued

Psychotherapy for mood disorders

CONTACTS

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Dr Jenny Jordan
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Dr Maree Inder
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Interpersonal psychotherapy

Perinatal psychiatry

Infant mental health

CONTACT

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DEPARTMENT OF RADIOLOGY

Topics related to:

- Spectral imaging (MARS imaging)
- Spectral imaging of breast and ovarian cancer cell models in vivo with nanoparticles and possible drug targets
- Fracture risk assessment and treatment monitoring of osteoporosis using MARS
- Cardiovascular and atheroma Imaging
- Image reconstruction
- X-ray detector physics and scanner design
- X-ray dosimetry
- Medical data visualisation
- Virtual Reality in Medicine
- Computer Aided Diagnosis and Image Processing
- MRI, Computed Tomography, and Ultrasound

The department has a range of radiology projects from basic imaging science to clinical studies. The department also hosts the bioengineering lab with projects in mechatronics, radiological software systems, and x-ray detector systems.

A major theme in the department is the development of 3D spectral x-ray imaging. As part of the project we are studying the underlying imaging technology such as energy selective photon processing detectors, construction of scanners, image recovery and computed tomography routines, image enhancement and material decomposition. The department uses small-bore scanners for this research and is in the development phase of building a human capable scanner for clinical trials

Clinically focused spectral x-ray projects include research into cardiovascular disease, cancer, bone health and nano-particle drug delivery.

CONTACTS

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Dr Aamir Raja
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DEPARTMENT OF SURGERY

- Surgical management of Inflammatory Bowel Disease
- Diverticular disease
- Genetics of colorectal cancer

CONTACT

A/Prof Tim Eglinton
03 364 3610
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- Early onset colorectal cancer
- Gut bacteria and colorectal cancer
- Host iron status and gastrointestinal disease
- Biomarkers and gastrointestinal disease

CONTACT

Dr Jacqui Keenan
03 364 0570
jacqui.keenan@otago.ac.nz

- Epidemiological studies of colorectal cancer in New Zealand
- Outcomes of Colorectal cancer in New Zealand
- Diverticular disease in Canterbury; patterns of presentation, predictors of recurrence and outcomes from surgery including quality of life.
- Epidemiological and outcome study of anal cancer

CONTACT

Prof Frank Frizelle
03 364 3608
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- Biomarkers of response to radiotherapy in rectal cancer
- The microbiome and diverticular disease
- Molecular mechanisms of colorectal cancer
- The role of the microbiome in the development of colorectal cancer
- The microbiome in colorectal cancer metastasis

CONTACT

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